OpenUniversiteitNederland

Sex differences in E-learning: *navigation and learning outcomes*

Christa M. van Mierlo, Paul A. Kirschner, & Liesbeth Kester
Learning & Cognition, CELSTEC, Open University, The Netherlands

Introduction

There are sex differences in internet navigation that result in different levels of success when searching for, retrieving and evaluating electronic information (Meyers-Levy & Maheswaran, 1991; Roy & Chi, 2003; Pan et al., 2004). Additionally, males generally have better spatial skills then females (3D route finding, as in Voyer, Voyer & Bryden, 1995). Females seem to process much more different types of information in the first stages of learning than males do, but only superficially, and they move on to the deeper processing at later stages. Males initially focus on less information sources than females do, but they process the information deeper. In later stages of learning, males move on to different topics that have overlap with what they have already processed.

Hypothesis

Men have a bottom up approach of mental model construction.
Women have a top down approach of mental model construction.

Research Questions

Do we find such sex differences in people's interaction with E-learning environments?
Do navigation differences result in differences in learning outcomes?

Method

Stimuli:
HLE describing the effects of alcohol and alcoholism on brain and body functioning.

Manipulations:
Abstractness of information (abstract vs. practical)
Reading or MC question
Text, pictures or text & pictures

Participants:
30 HAVO/VWO students 14-15-16 year old

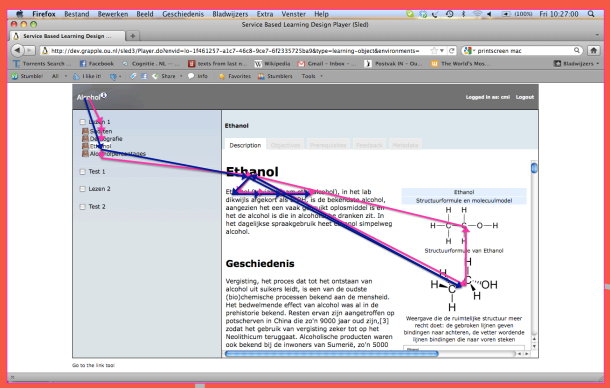
Apparatus:
SMI eye tracker with iView 250 Hz
Mouse sampling (Matlab Psychtoolbox) 62.5 Hz
HLE:
Recourse Authoring Tool (IMS-LD)
Coppercore Link Tool

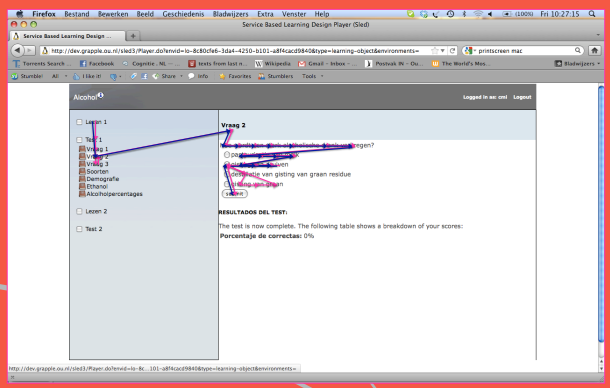
Analysis

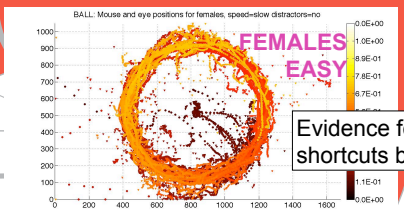
Independent variable:
Sex

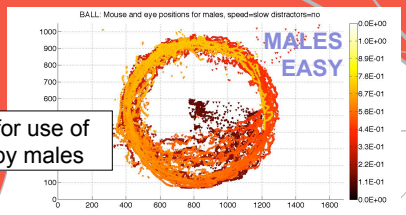
Independent variables:
•Route: window sequence
•Eye position: scan paths
•Mouse position: mouse paths
•Distance between scan & mouse paths (vector comparison)
•Delays between scan & mouse paths (vector comparison)
•Performance on post-test and transfer test

Covariates:
•Onset of puberty
•Age
•Background knowledge (measured in pretest)
•Visuo-spatial skills: maze and mental rotation tests









Evidence for use of shortcuts by males

Centre for Learning Sciences and Technologies
celstec.org